



Timber Sale Appraisal
Fern Hill
Sale WO-341-2017-47-

District: West Oregon

Date: July 05, 2016

Cost Summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$1,470,260.00	\$109,075.53	\$1,579,335.53
		Project Work:	(\$43,547.00)
		Advertised Value:	\$1,535,788.53



Timber Sale Appraisal
Fern Hill
Sale WO-341-2017-47-

District: West Oregon

Date: July 05, 2016

Timber Description

Location: Portions of Sections 22, 27, and 28, T10S, R7W, W.M., Benton County, Oregon.

Stand Stocking: 20%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	25	0	95
Alder (Red)	17	0	90

Volume by Grade	3P	SM	2S	3S	4S	Camprun	Total
Douglas - Fir	72	216	2,598	686	36	0	3,608
Alder (Red)	0	0	0	0	0	291	291
Total	72	216	2,598	686	36	291	3,899

Comments: Pond Values Used: 2nd Quarter Calendar Year 2016.

Western Hemlock and Other Conifers Stumpage Price = Pond Value minus Logging Cost:
 $\$262.86/\text{MBF} = \$470.00/\text{MBF} - \$207.14/\text{MBF}$

Western redcedar and Other Cedars Stumpage Price = Pond Value minus Logging Cost:
 $\$967.86/\text{MBF} = \$1,175.00/\text{MBF} - \$207.14/\text{MBF}$

SCALING COST ALLOWANCE = \$5.00/MBF

FUEL COST ALLOWANCE = \$3.00/Gallon

HAULING COST ALLOWANCE:
Hauling costs equivalent to \$780 daily truck cost.

Log Haul:
Conifer costed to Eugene.
Hardwood costed to Eugene.

Other Costs (with Profit & Risk to be added):
Log Branding & Painting: 3,899 MBF @ \$1/MBF = \$3,899
Intermediate Supports/Tail Trees: 5 trees @ \$100/tree = \$500
TOTAL Other Costs (with Profit & Risk to be added) = \$4,399

Other Costs (No Profit & Risk added):
Invasive Species Equipment Cleaning: \$4,000
Firewood Sorting: 2 Landings @ \$100/Landing = \$200
Logger's Choice Road/Landing = \$500
TOTAL Other Costs (No Profit & Risk added) = \$4,700

SLASH DISPOSAL
Move-in: \$750
Project Work : 62 hours @ \$150/hour = \$9,300
TOTAL Slash Disposal = \$10,050



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Logging Conditions

Combination#: 1 Douglas - Fir 20.00%
 Alder (Red) 20.00%

Logging System: Cable: Medium Tower >40 - <70 **Process:** Stroke Delimber

yarding distance: Short (400 ft) **downhill yarding:** No

tree size: Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF

loads / day: 12 **bd. ft / load:** 4600

cost / mbf: \$108.70

machines: Log Loader (A)
Stroke Delimber (A)
Tower Yarder (Medium)

Combination#: 2 Douglas - Fir 25.00%
 Alder (Red) 25.00%

Logging System: Cable: Medium Tower >40 - <70 **Process:** Stroke Delimber

yarding distance: Medium (800 ft) **downhill yarding:** No

tree size: Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF

loads / day: 10 **bd. ft / load:** 4600

cost / mbf: \$130.44

machines: Log Loader (A)
Stroke Delimber (A)
Tower Yarder (Medium)

Combination#: 3 Douglas - Fir 55.00%
 Alder (Red) 55.00%

Logging System: Shovel **Process:** Stroke Delimber

yarding distance: Medium (800 ft) **downhill yarding:** No

tree size: Mature / Partial Cut (900 Bft/tree), 3-5 logs/MBF

loads / day: 10 **bd. ft / load:** 4600

cost / mbf: \$68.96

machines: Stroke Delimber (B)



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District: West Oregon

Date: July 05, 2016

Logging Costs

Operating Seasons: 2.00	Profit Risk: 10%
Project Costs: \$43,547.00	Other Costs (P/R): \$4,399.00
Slash Disposal: \$10,050.00	Other Costs: \$4,700.00

Miles of Road

Road Maintenance: \$2.63

Dirt	Rock (Contractor)	Rock (State)	Paved
0.0	0.0	0.0	0.0

Hauling Costs

Species	\$ / MBF	Trips/Day	MBF / Load
Douglas - Fir	\$0.00	2.0	5.0
Alder (Red)	\$0.00	2.0	4.0



Timber Sale Appraisal
Fern Hill
Sale WO-341-2017-47-

District: West Oregon

Date: July 05, 2016

Logging Costs Breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Scaling	Other	Total
Douglas - Fir									
\$92.28	\$2.76	\$2.25	\$81.90	\$1.13	\$18.03	\$2.58	\$5.00	\$1.21	\$207.14
Alder (Red)									
\$92.28	\$2.89	\$2.25	\$107.25	\$1.13	\$20.58	\$2.58	\$5.00	\$1.21	\$235.17

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$614.64	\$407.50	\$0.00
Alder (Red)	\$0.00	\$610.00	\$374.83	\$0.00



Timber Sale Appraisal
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District: West Oregon

Date: July 05, 2016

Summary

Amortized

Specie	MBF	Value	Total
Douglas - Fir	0	\$0.00	\$0.00
Alder (Red)	0	\$0.00	\$0.00

Unamortized

Specie	MBF	Value	Total
Douglas - Fir	3,608	\$407.50	\$1,470,260.00
Alder (Red)	291	\$374.83	\$109,075.53

Gross Timber Sale Value

Recovery: \$1,579,335.53

Prepared By: Matthew McBride

Phone: 541-929-3266

SUMMARY OF ALL PROJECT COSTS

Sale Name: Fern Hill

Date: May 2016

Time: 15:46

Project #1 - New Construction

<u>Road Segment</u>	<u>Length</u>	<u>Cost</u>
C6 to C7	2.2 sta	\$738

TOTALS

2.2 sta

\$738

Project #2 - Improvements

<u>Road Segment</u>	<u>Length</u>	<u>Cost</u>
A to A1	78.8 sta	\$14,024
B to B1	37.8 sta	\$5,915
B2 to B3	4.3 sta	\$571
B4 to B5	2.3 sta	\$125
C to C1	37.4 sta	\$6,779
C2 to C3	2.2 sta	\$291
C4 to C5	5.2 sta	\$291

TOTALS

168.0 sta

\$27,996

Project #3 - Brushing

\$981

Project #4 - Post Harvest Activities

Landing patch rock and turnaround rock

\$1,368

Project #5 - Rock Stockpile

\$8,947

Move in

	<u>Cost</u>	<u>On-site move</u>
Excavator (2)	\$1,505	\$30
Crawler tractor, D-7 or equiv.	\$547	\$26
Grader, Cat 12 or equiv.	\$340	\$10
Backhoe	\$340	\$20
Mechanical Brusher	\$340	
Vibratory roller	\$340	\$19

TOTAL

\$3,517

GRAND TOTAL

\$43,547

Compiled by J. Long

Date 05/09/2016

SUMMARY OF CONSTRUCTION COST

SALE Fern Hill Project # 2 LENGTH improve 78.8 sta
ROAD A to A1

CLEARING AND GRUBBING

0.10 acres @ \$1,010.24 /acre = \$101 landing

TOTAL CLEARING AND GRUBBING = \$101

IMPROVEMENT

Grade/shape surface 78.8 sta @ \$13.75 /sta = \$1,084
(with road grader)

Compact surface rock 78.8 sta @ \$8.31 /sta = \$655
(with vibratory roller)

Pull ditch and scatter 25.0 sta @ \$12.41 /sta = \$310
waste material

TOTAL IMPROVEMENT = \$2,049

EXCAVATION

Medium size excavator (C325) and D7 cat or equivalent

Construct Turnouts 2 hr @ \$135.80 /hr = \$272

Remove Bank Slough & Stumps 2 hr @ \$127.68 /hr = \$255

TOTAL EXCAVATION = \$527

SURFACING

		Size	Cost/yd		
Surface rock (6"lift)	117 cy of	3-0"	\$18.02	=	\$2,108
(Sta. 46+50 to 49+50)					

Turnout rock (3)	90 cy of	3-0"	\$18.02	=	\$1,622
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Landing rock	45 cy of	jaw-run	\$17.01	=	\$765
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Junction rock	63 cy of	3-0"	\$18.02	=	\$1,135
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Spot rock	162 cy of	1½-0"	\$19.71	=	\$3,193
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Spot rock	72 cy of	3-0"	\$18.02	=	\$1,297
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Culvert bedding rock	18 cy of	1½-0"	\$19.71	=	\$355
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TOTAL ROCK COST = \$10,475

SPECIAL PROJECTS

Install x-drain 30 ft @ \$17.50 /ft = \$525
(18" x 30')

Vibratory hand compactor 1 day @ \$90.00 /day : \$90

Clean out culverts 10 culverts @ \$25.67 ea = \$257
(inlets and outlets)

TOTAL SPECIAL PROJECTS COST = \$872

Compiled by: J. Long
Date: May 9, 2016

GRAND TOTAL =====> \$14,024

SUMMARY OF CONSTRUCTION COST

SALE Fern Hill Project # 2 LENGTH improve 37.8 sta
ROAD B to B1

CLEARING AND GRUBBING

2.60 acres	@	\$536.48 /acre	=	\$1,395 road
0.10 acres	@	\$536.48 /acre	=	\$54 landing

TOTAL CLEARING AND GRUBBING = \$1,449

IMPROVEMENT

Shape surface (with road grader)	37.8 sta	@	\$9.90 /sta	=	\$374
Compact subgrade (with vibratory roller)	37.8 sta	@	\$8.31 /sta	=	\$314
Compact Surfacing (with vibratory roller)	1.0 sta	@	\$8.90 /sta	=	\$9

TOTAL IMPROVEMENT = \$697

EXCAVATION

Construct temporary stream crossing at Sta. 18+70

(see cost sheet)				=	\$2,079
Fill in old well (near Pt. B)	2 hr	@	\$127.68 /hr	=	\$255
Haul in fill material from borrow site	2 hr	@	\$68.88 /hr	=	\$138

TOTAL Special Projects = \$2,472

SURFACING

		Size	Cost/yd		
Base rock (0+00 to 1+00)	45 cy of	jaw-run	\$17.01	=	\$765
Culvert bedding rock	27 cy of	1½-0"	\$19.71	=	\$532

TOTAL ROCK COST = \$1,297

Compiled by: J. Long
Date: May 9, 2016

GRAND TOTAL =====> \$5,915

Fill Reconstruction Cost Estimate

Segment: B to B1 Station: 18+70
 Fill: 1 Height: 9'

Materials	Quantity		\$	Total
24"x50', CPP	50		\$18.24	\$912.00
24"-6" Riprap Dissipator		cy		\$0.00
24"-6" Riprap Fill Armor		cy		\$0.00
1 1/2"-0" Crushed Rock for Bedding/Backfill	27	cy	\$19.71	\$532.17
4"-0" Crushed Rock for Road		cy		\$0.00
Erosion Control		ac		\$0.00
Mulch and seed				

\$1,444.17

Excavation	Rate		CY/amount	Total
End-Haul excavation \$/cy				\$0.00
<i>Excavate Fill</i>				\$0.00
<i>Backfill from barrow site</i>	\$4.00		112	\$448.00
Compaction w/Vibratory hand compa	\$90.00		1	\$90.00
<i>Backfill (barrow & crushed rock)</i>	\$0.70		139	\$97.30
<i>Waste material compaction</i>				\$0.00
Fill armor placement w/330, \$/hr				\$0.00
Laborer \$/hr				\$0.00

\$635.30

Project Total \$2,079

SUMMARY OF CONSTRUCTION COST

SALE Fern Hill Project # 2 LENGTH improve 4.3 sta
ROAD B2 to B3

CLEARING AND GRUBBING

0.30 acres @ \$536.48 /acre = \$161 road
0.10 acres @ \$594.72 /acre = \$59 landing

TOTAL CLEARING AND GRUBBING = \$220

IMPROVEMENT

Shape surface 4.3 sta @ \$9.90 /sta = \$43
(with road grader)
Compact subgrade 4.3 sta @ \$8.31 /sta = \$36
(with vibratory roller)

TOTAL IMPROVEMENT = \$79

EXCAVATION

With D7 dozer or equivalent
Construct landing 2 hr @ \$135.80 /hr = \$272

TOTAL EXCAVATION = \$272

Compiled by: J. Long
Date: May 9, 2016

GRAND TOTAL =====> \$571

SUMMARY OF CONSTRUCTION COST

SALE Fern Hill Project # 2 LENGTH improve 2.3 sta
ROAD B4 to B5

IMPROVEMENT

Re-open road	2.3 sta	@	\$24.76 /sta	=	\$57
Re-open landing	0.5 hrs	@	\$ 135.80 /hr	=	\$68

TOTAL IMPROVEMENT = \$125

Compiled by: J. Long
Date: May 9, 2016

GRAND TOTAL =====> \$125

SUMMARY OF CONSTRUCTION COST

SALE Fern Hill Project # 2 LENGTH improve 37.4 sta
ROAD C to C1

CLEARING AND GRUBBING

2.60 acres @ \$1,010.24 /acre = \$2,627 road

TOTAL CLEARING AND GRUBBING = \$2,627

EXCAVATION

Medium size excavator (C325) and D7 cat or equivalent

Drift earth up to 200' (Sta. 0+00 to 15+55)	528 cy	@	\$1.64 /cy	=	\$866
End-haul excavation	200 cy	@	\$4.00 /cy	=	\$800
Fill compaction	670 cy	@	\$0.36 /cy	=	\$241
Shape subgrade (with road grader)	37.4 sta	@	\$11.55 /sta	=	\$432
Compact subgrade (with vibratory roller)	37.4 sta	@	\$8.31 /sta	=	\$311
Compact surfacing (with vibratory roller)	1.5 sta	@	\$8.90 /sta	=	\$13
Construct Turnouts (2)	1 hr	@	\$110.60 /hr	=	\$111

TOTAL EXCAVATION = \$2,774

SURFACING

			Size	Cost/yd		
Base rock (0+00 to 1+50)	81	cy of	jaw-run	\$17.01	=	\$1,378

TOTAL ROCK COST = \$1,378

Compiled by: J. long
Date: May 9, 2016

GRAND TOTAL =====> \$6,779

SUMMARY OF CONSTRUCTION COST

SALE Fern Hill Project # 2 LENGTH improve 2.2 sta
ROAD C2 to C3

CLEARING AND GRUBBING

0.10 acres @ \$1,010.24 /acre = \$101 landing

TOTAL CLEARING AND GRUBBING = \$101

IMPROVEMENT

Re-open road 2.2 sta @ \$24.76 /sta = \$54

TOTAL IMPROVEMENT = \$54

EXCAVATION

Construct landing With D7 dozer or equivalent
1 hr @ \$135.80 /hr = \$136

TOTAL EXCAVATION = \$136

Compiled by: J. Long
Date: May 9, 2016

GRAND TOTAL =====> \$291

SUMMARY OF CONSTRUCTION COST

SALE Fern Hill
ROAD C4 to C5

Project # 2

LENGTH improve

5.2 sta

IMPROVEMENT

Re-open road	5.2 sta	@	\$24.76 /sta	=	\$129
Re-open landing	0.5 hrs	@	\$ 135.80 /hr	=	\$68
Shape surface (with road grader)	5.2 sta	@	\$9.90 /sta	=	\$51
Compact subgrade (with vibratory roller)	5.2 sta	@	\$8.31 /sta	=	\$43

TOTAL IMPROVEMENT = \$291

Compiled by: J. Long
Date: May 9, 2016

GRAND TOTAL =====> \$291

SUMMARY OF CONSTRUCTION COST

SALE Fern Hill Project # 1 LENGTH const 2.2 sta
ROAD C6 to C7

CLEARING AND GRUBBING

0.20 acres	@	\$1,010.24 /acre	=	\$202 road
0.10 acres	@	\$1,010.24 /acre	=	\$101 landing

TOTAL CLEARING AND GRUBBING = \$303

EXCAVATION

With D7 dozer or equivalent

Construct road	2.2 sta	@	\$74.28 /sta	=	\$163
Construct landing	2 hr	@	\$135.80 /hr	=	\$272

TOTAL EXCAVATION = \$435

Compiled by:

J. Long

Date:

May 9, 2016

GRAND TOTAL =====>

\$738

SALE ROAD	Fern Hill	Project #3	Roadside Brushing
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GRAND TOTAL =====> \$981

Compiled by: D. Wiger Date: May 9, 2016

SUMMARY OF CONSTRUCTION COST

SALE Fern Hill - Project #4 Post Harvest

SURFACING

		Size	Cost/CY		
Turnout rock (Sta. 53+50) (A to A1)	18 cy of	1½-0"	\$19.71	=	\$ 355
Junction patch rock (1) (C2)	18 cy of	1½-0"	\$18.02	=	\$ 324

TOTAL SURFACING COST =	\$679
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MISCELLANEOUS PROJECTS

Remove temporary fill and culvert at Sta. 18+70	4 hr.	@	\$127.68 /hr. =	\$511
Haul culvert to ODF	1 hr.	@	\$61.50 /hr. =	\$62
Tank trap (1) at Pt. B (1+100)	0.5 hr.	@	\$77.00 /hr. =	\$39
Tank trap (2) at Pt. C (1+50) & Pt. C2 (0+25)	1 hr.	@	\$77.00 /hr. =	\$77

TOTAL MISCELLANEOUS PROJECTS =	\$689
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GRAND TOTAL =====> \$1,368

Compiled by: J. long
Date: May 9, 2016

SUMMARY OF CONSTRUCTION COST

SALE Fern Hill
Stockpile Construction

Project # 5

Construct stockpile	With C315 Excavator or D4 Cat				
Shape stockpile w/small exca	4 hr	@	\$110.60 /hr	=	\$442

\$442

ROCK HAUL

ROCK HAUL		Size	Cost/yd		
1 1/2"-0" Crushed rock	500 cy of	1½-0"	\$17.01	=	\$8,505

TOTAL ROCK COST = \$8,505

Compiled by: J. Long
Date: May 9, 2016

GRAND TOTAL =====> \$8,947

SUMMARY OF MAINTENANCE COST

SALE	Fern Hill	- Final Maintenance Cost Estimate (Costed in appraisal, not in project costs)
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Grading	Move-in	\$	340
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Road Segment	Length	Cost/Sta	Cost	Mileage
Surfaced Roads				
Shingle Creek Rd.	116.2	\$13.75	\$1,597.75	2.20
A to C	58.3	\$13.75	\$801.63	1.10
Unsurfaced Roads				
B to B1	37.8	\$11.55	\$436.59	0.72
B2 to B3	4.3	\$11.55	\$49.67	0.08
B4 to B5	2.3	\$11.55	\$26.57	0.04
C to C1	37.4	\$11.55	\$431.97	0.71
C2 to C3	2.2	\$11.55	\$25.41	0.04
C4 to C5	5.2	\$11.55	\$60.06	0.10
C6 to C7	2.2	\$11.55	\$25.41	0.04
Total	265.9		\$3,455.06	5.04

Compacting	Move-in	\$	340
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Road Segment	Length	Cost/Sta	Cost	Mileage
A to C	58.3	\$8.31	\$484.47	1.10

Maintenance Rock:

1½'-0"	Volume	Cost/CY	Cost
	285	\$19.71	\$5,617.35

Grand Total	\$ 10,236.88
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TS Volume 3,899 MBF

Cost / MBF = \$2.63

NOTES:

Unsurfaced roads: grade out ruts and install waterbars as directed by State with grader or dozer.

Rock Haul Cost Computation

SALE NAME: Fern Hill DATE: May 9, 2016
ROAD NAME: Shingle Hollow/Bottger CLASS: Medium
ROCK SOURCE: Wild Rose 12 CY truck
Route: KV Hwy, Luckiamute Rd, Hoskins-Summit, Shingle Crk, Shingle Hollow to Stockpile

TIME Computation:

Road speed time factors:

1.	55 MPH		MRT	0.0 minutes
2.	50 MPH	9.4	MRT	11.3 minutes
3.	45 MPH		MRT	0.0 minutes
4.	40 MPH	3.6	MRT	5.4 minutes
5.	35 MPH		MRT	0.0 minutes
6.	30 MPH		MRT	0.0 minutes
7.	25 MPH	6.2	MRT	14.9 minutes
8.	20 MPH	4.5	MRT	13.5 minutes
9.	15 MPH	1.5	MRT	6.0 minutes
10.	10 MPH		MRT	0.0 minutes
11.	05 MPH		MRT	0.0 minutes

Dump or spread time per RT 0.50 minutes

Total hauling cycle time for this setting
(100% efficiency) 51.60 minutes

Operator efficiency correction 0.85 60.71 minutes

Job efficiency correction 0.90 67.46 minutes

Truck capacity (CY) 9.00 7.50 min/CY

Loading time, delay time per CY 0.25 min/CY

TIME (minutes) per cubic yard 7.75 min/CY

COST per CY computation

Cost of truck and operator per hour \$68.88 /hr.

Cost of truck and operator per minute \$1.15 /min

Cost per CY \$8.91 /CY

Spread and compact Water truck, Grader & Roller \$1.50 /CY

Size	Cost/Yd (Pit)	Cost Delivered w/o processing	Cost Delivered with processing
1½ - 0"	\$ 10.80	\$19.71	\$21.21
3 - 0"	\$ 9.11	\$18.02	\$19.52
Jaw Run	\$ 8.10	\$17.01	\$18.51
Pit-Run	7.43	\$16.34	\$17.84

Rock Haul Cost Computation

SALE NAME: Fern Hill DATE: May 9, 2016
ROAD NAME: Shingle Hollow/Bottger CLASS: Medium
ROCK SOURCE: Wild Rose 12 CY truck
Route: KV Hwy to Shingle Crk to Sale Area

TIME Computation:

Road speed time factors:

1.	55 MPH	MRT	0.0 minutes
2.	50 MPH	9.4 MRT	11.3 minutes
3.	45 MPH	MRT	0.0 minutes
4.	40 MPH	3.6 MRT	5.4 minutes
5.	35 MPH	MRT	0.0 minutes
6.	30 MPH	MRT	0.0 minutes
7.	25 MPH	6.2 MRT	14.9 minutes
8.	20 MPH	4.5 MRT	13.5 minutes
9.	15 MPH	1.5 MRT	6.0 minutes
10.	10 MPH	MRT	0.0 minutes
11.	05 MPH	MRT	0.0 minutes

Dump or spread time per RT 0.50 minutes

Total hauling cycle time for this setting
(100% efficiency) 51.60 minutes

Operator efficiency correction 0.85 60.71 minutes

Job efficiency correction 0.90 67.46 minutes

Truck capacity (CY) 11.00 6.13 min/CY

Loading time, delay time per CY 0.25 min/CY

TIME (minutes) per cubic yard 6.38 min/CY

COST per CY computation

Cost of truck and operator per hour \$75.50 /hr.

Cost of truck and operator per minute \$1.26 /min

Cost per CY \$8.04 /CY

Spread and compact Water truck, Grader & Roller \$1.50 /CY

Size	Cost/Yd (Pit)	Cost Delivered w/o processing	Cost Delivered with processing
1½ - 0"	\$ 10.80	\$18.84	\$20.34
3 - 0"	\$ 9.11	\$17.15	\$18.65
Jaw Run	\$ 8.10	\$16.14	\$17.64
Pit-Run	7.43	\$15.47	\$16.97

Note: Pit costs November 28, 2012 Rickard Rock Quarry

Rock Haul Cost Computation

SALE NAME: Fern Hill DATE: May 9, 2016
ROAD NAME: Shingle Hollow CLASS: Medium
ROCK SOURCE: Wild Rose 12 CY truck
Route: KV Hwy to Shingle Creek to Stock Pile.

TIME Computation:

Road speed time factors:

1.	55 MPH	MRT	0.0 minutes
2.	50 MPH	MRT	0.0 minutes
3.	45 MPH	9.4 MRT	12.5 minutes
4.	40 MPH	MRT	0.0 minutes
5.	35 MPH	3.6 MRT	6.2 minutes
6.	30 MPH	MRT	0.0 minutes
7.	25 MPH	6.2 MRT	14.9 minutes
8.	20 MPH	4.5 MRT	13.5 minutes
9.	15 MPH	1.5 MRT	6.0 minutes
10.	10 MPH	MRT	0.0 minutes
11.	05 MPH	MRT	0.0 minutes

Dump or spread time per RT 0.50 minutes

Total hauling cycle time for this setting
(100% efficiency) 53.60 minutes

Operator efficiency correction 0.85 63.06 minutes

Job efficiency correction 0.90 70.07 minutes

Truck capacity (CY) 18.00 3.89 min/CY

Loading time, delay time per CY 0.25 min/CY

TIME (minutes) per cubic yard 4.14 min/CY

COST per CY computation

Cost of truck and operator per hour \$90.22 /hr.

Cost of truck and operator per minute \$1.50 /min

Cost per CY \$6.21 /CY

Spread and compact Water truck, Grader & Roller \$1.50 /CY

Size	Cost/Yd (Pit)	Cost Delivered w/o processing	Cost Delivered with processing
1½ - 0"	\$ 10.80	\$17.01	\$18.51
3 - 0"	\$ 9.11	\$15.32	\$16.82
Jaw Run	\$ 8.10	\$14.31	\$15.81
Pit-Run	7.43	\$13.64	\$15.14

Note: Pit costs November 28, 2012 Rickard Rock Quarry

**Fern Hill (341-17-47)
FY 2017**

TIMBER CRUISE REPORT

1. **Sale Area Location:** Portions of Sections 22, 27 and 28, T10S, R7W, W.M., Benton County, Oregon.
2. **Fund Distribution:**
 - a. **Fund** BOF 100%
 - b. **Tax Code**
3. **Sale Acreage by Area:**

Area	Treatment	Gross Acres	Stream Buffers	Existing Roads	Green Tree Retention Areas	Net Sale Acres	Acreage Comp. Method
1	Modified Clearcut	36	0	1	2	33	Ortho photo, GIS, GPS
2	Modified Clearcut	78	5	4	1	68	Ortho photo, GIS, GPS
Total		114	6	5	2	101	

4. **Cruisers and Cruise Dates:** The sale was cruised by Matt McBride, Jon Long and David Wiger in January and February of 2016.

5. **Cruise Method and Computation:** The sale consists of 2 modified clearcut areas that were cruised using variable radius plot sampling. The sale area was cruised using a 40 BAF with plots spaced 2.5 chains apart on plot lines spaced 5 chains apart in Area 1, and 2.5 chains apart on plot lines spaced 6 chains apart in Area 2. A total of 74 plots were taken with 50 count plots and 24 cruise plots. Cruise plots were measured for DBH, height, form factor, grade, and defect. Data was entered into the Atterbury SuperACE 2008 cruise program to calculate net board feet per acre. Individually marked green trees within the sale area were tallied and removed from the final calculated volume.

Digital ortho photos, Lidar data, and GPS data from a Garmin GPSmap 62s were used to map the boundaries for the sale, and ArcMap 10.2 was used to determine gross and net acreage.

6. **Measurement Standards:** Heights were measured to the nearest foot, to a top diameter of 6 inches inside bark or to 40% of form factor. Diameters were measured to the nearest inch, and a form point of 16 feet was used to calculate form factor. Most trees were graded in 40 foot log segments unless breakage, defect, or length to top of grade cruise diameter warranted otherwise.
7. **Timber Description:** Timber in the sale area consists of 63 to 130 year-old Douglas-fir, red alder, and western hemlock. Western hemlock is reserved from cutting but were only observed in minor amounts scattered through the sale area. The Average Douglas-fir tree size to be harvested is approximately 25 inches DBH, with an average height of 114 feet to a merchantable top. The average red alder is approximately 16.7 inches DBH, with an average height of 54 feet to a merchantable top. Big leaf Maple is a minor component of the stand and the volume was added to the red alder volumes. The average volume per acre to be harvested (net) is 38.6 MBF.

8. Statistical Analysis and Stand Summary: (See attached “Statistics”).

Area	Target CV	Target SE	Actual CV	Actual SE
1	65%	9%	39.2%	7.5%
2	65%	9%	49.0%	7.2%
1 & 2	65%	9%	49.8%	5.8%

Note: Statistics shown are for conifer and hardwood trees combined. Percentages are for net board foot volume.

9. Total Volume (MBF) by Species and Grade: (See attached “Stand Table Summary” and “Species, Sort Grade”).

Species	Gross Cruise Volume	Cruised D & B	Cruised D & B (MBF)	Hidden D & B	Hidden D & B (MBF)	Net Sale Volume
Douglas-fir	3,918	3%	114	5%	196	3,608
Red alder	321	4%	14	5%	16	291
Total	4,239	3%	128	5%	212	3,899

Species	DBH	Net Vol.	3 Peeler	Special Mill	2-Saw	3-Saw	4-Saw	Camp Run	% by Species
Douglas-fir	Grade Percentages		2%	6%	72%	19%	1%	--	93%
	25	3,608	72	216	2,598	686	36	--	
Red alder	Grade Percentages		--	--	--	--	--	100%	
	17	291	--	--	--	--	--	291	7%
Total	Grade Percentages		2%	5%	67%	18%	1%	7%	100%
		3,899	72	216	2,598	686	36	291	

Attachments: Cruise Maps
Species, Sort Grade – Board Foot Volumes
Statistics
Stand Table Summary
Log Stock Table – MBF

Prepared by: Matt McBride

Date: 05/10/2016

Unit Forester: _____

Evelyn Hukari

Date: _____

TC PSTATS			PROJECT STATISTICS					PAGE	1		
			PROJECT		FERN 3			DATE	4/5/2016		
TWP	RGE	SC	TRACT	TYPE	ACRES		PLOTS	TREES	CuFt	BdFt	
10S	07	27	FERNHILL	ALL	101.00		74	364	1	W	
			PLOTS	TREES	TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL		SAMPLE				
					TREES		TREES				
TOTAL			74	364	4.9						
CRUISE			24	109	4.5		7,114		1.5		
DBH COUNT											
REFOREST											
COUNT			49	251	5.1						
BLANKS			1								
100 %											
STAND SUMMARY											
			SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS
			TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC
DF			79	45.9	25.0	114	31.2	156.0	39,102	37,977	8,273
R ALDER			21	22.8	16.7	54	8.5	34.6	3,157	3,024	987
DF LEAVE			7	.5	48.6	150	0.9	5.9	2,049	1,965	369
SNAG			1	.9	18.0	85	0.4	1.6			
BL MAPLE			1	.3	17.0	43	0.1	.5	24	24	12
TOTAL			109	70.4	22.7	94	41.7	198.7	44,331	42,991	9,641
CONFIDENCE LIMITS OF THE SAMPLE											
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR											
CL	68.1	COEFF	SAMPLE TREES - BF					# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5		10	15	
DF			65.2	7.3	1,113	1,201	1,289				
R ALDER			53.4	11.9	134	152	171				
DF LEAVE			56.3	22.9	4,642	6,023	7,404				
SNAG											
BL MAPLE											
TOTAL			130.5	12.5	1,126	1,287	1,448	680	170	76	
CL	68.1	COEFF	SAMPLE TREES - CF					# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5		10	15	
DF			56.7	6.4	236	252	268				
R ALDER			46.5	10.4	45	50	55				
DF LEAVE			52.7	21.4	866	1,103	1,339				
SNAG											
BL MAPLE											
TOTAL			113.5	10.9	235	263	292	514	129	57	
CL	68.1	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5		10	15	
DF			62.8	7.3	43	46	49				
R ALDER			173.2	20.1	18	23	27				
DF LEAVE			367.3	42.7	0	0	1				
SNAG			489.8	56.9	0	1	1				
BL MAPLE			860.2	99.9	0	0	1				
TOTAL			59.2	6.9	66	70	75	140	35	16	
CL	68.1	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5		10	15	
DF			56.0	6.5	146	156	166				
R ALDER			179.9	20.9	27	35	42				
DF LEAVE			380.6	44.2	3	6	9				
SNAG			489.8	56.9	1	2	3				
BL MAPLE			860.2	99.9	0	1	1				
TOTAL			44.0	5.1	189	199	209	77	19	9	

TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
10S	07	27	FERNHILL	ALL	101.00	74	364	1	W

CL	68.1	COEFF	NET BF/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DF		56.3	6.5	35,492	37,977	40,462			
R ALDER		174.8	20.3	2,410	3,024	3,638			
DF LEAVE		381.5	44.3	1,095	1,965	2,836			
SNAG									
BL MAPLE		860.2	99.9	0	24	48			
TOTAL		46.7	5.4	40,661	42,991	45,320	87	22	10

CL	68.1	COEFF	NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DF		56.5	6.6	7,731	8,273	8,816			
R ALDER		178.4	20.7	782	987	1,192			
DF LEAVE		382.1	44.4	205	369	533			
SNAG									
BL MAPLE		860.2	99.9	0	12	24			
TOTAL		45.0	5.2	9,138	9,641	10,145	81	20	9

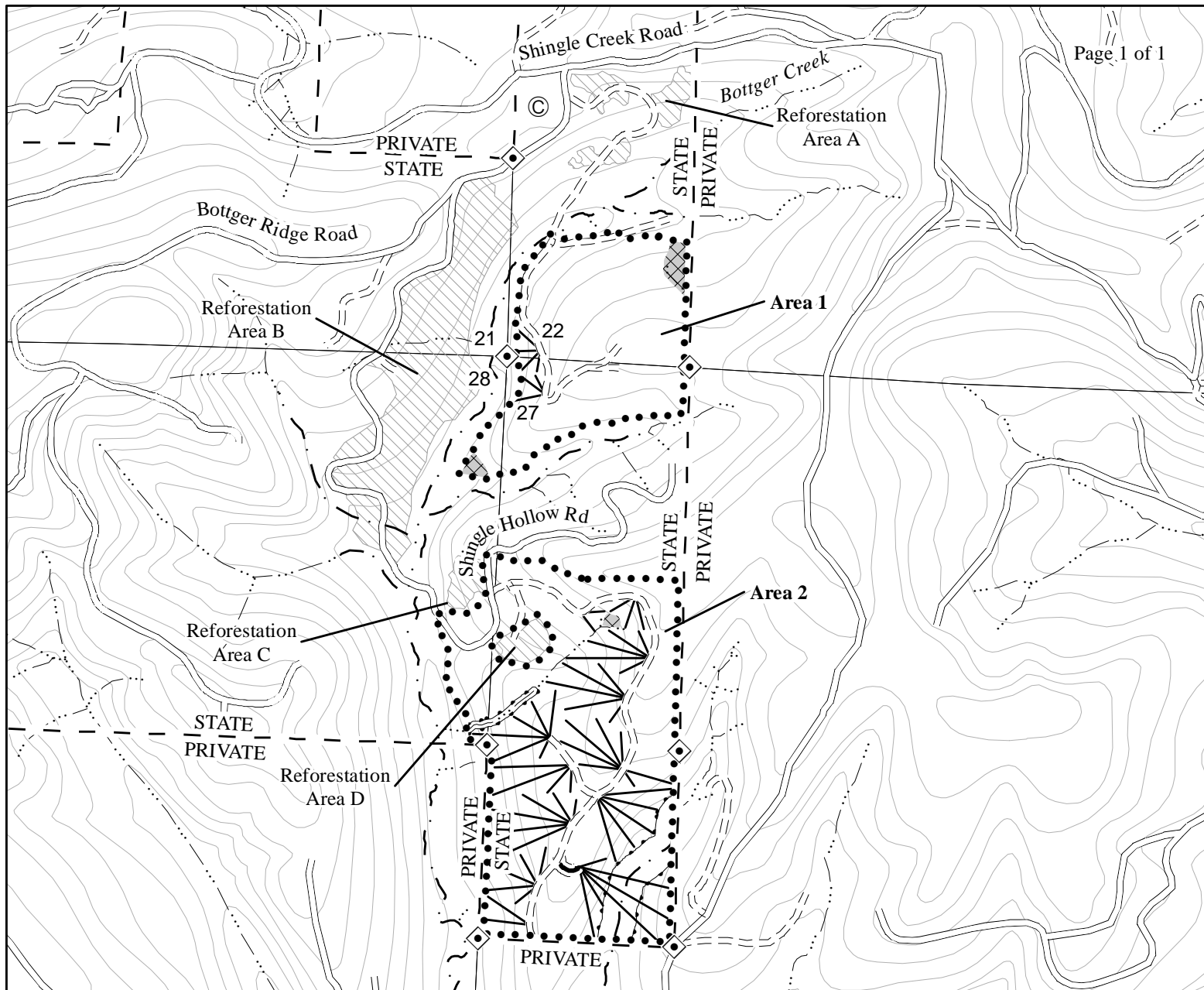
T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)												Page		1			
				Project: FERN_3												Date		4/5/2016			
																Time		3:26:14PM			
T10S R07W S27 TALL														T10S R07W S27 TALL							
Twp		Rge		Sec		Tract		Type		Acres		Plots		Sample Trees		CuFt		BdFt			
10S		07W		27		FERNHILL		ALL		101.00		74		109		1		W			
S So Gr T rt ad Spp				% Net BdFt	Bd. Ft. per Acre Def% Gross Net			Total Net MBF	Percent Net Board Foot Volume								Average Log				Logs Per /Acre
									Log Scale Dia.				Log Length				Ln	Dia	Bd	CF/ Lf	
									4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Ft	In	Ft		
DF				CU													16	19		0.00	3.2
DF				2M	71	2.9	28,131	27,325	2,760		35	65		1	2	97	40	17	482	2.47	56.6
DF				3M	19	2.1	7,084	6,934	700	58	25	17	1	2	13	84	38	10	140	1.03	49.4
DF				4M	1		517	517	52	100			38	54	9		22	7	33	0.52	15.5
DF				3P	2	1.2	699	691	70		100				100		40	30	1659	7.38	.4
DF				SM	6	6.8	2,339	2,179	220		100				44	56	37	22	704	3.79	3.1
DF				PU	1		330	330	33		100		36		64		16	19	191	2.60	1.7
DF		Totals		88	2.9	39,102	37,977	3,836		12	30	58	1	2	7	90	36	13	292	1.77	130.0
RA				CU													4	14		0.00	6.3
RA				CR	100	4.2	3,157	3,024	305	62	38		9	21	28	42	31	9	89	0.95	34.2
RA		Totals		7	4.2	3,157	3,024	305		62	38		9	21	28	42	26	10	75	0.93	40.5
DFL				CU													18	22		0.00	.0
DFL				2M	30	7.6	655	605	61		100			21	79		39	26	1173	5.75	.5
DFL				3M	69	2.5	1,380	1,346	136	1	5	95		13	87		39	25	1371	6.45	1.0
DFL				4M	1		14	14	1	100			100				24	8	43	0.78	.3
DFL		Totals		5	4.1	2,049	1,965	199		1	3	96		1	15	84	36	22	1063	5.52	1.8
BM				CR	100		24	24	2	100				100			40	7	70	0.87	.3
BM		Totals		0		24	24	2		100				100			40	7	70	0.87	.3
Type Totals						3.0	44,331	42,991	4,342	15	29	56	2	3	9	86	34	12	249	1.65	172.6

TC		Stand Table Summary															
Project FERN 3																	
T10S R07W S27 TALL												T10S R07W S27 TALL					
Twp	Rge	Sec	Tract		Type			Acres		Plots	Sample Trees		Page: 1				
10S	07W	27	FERNHILL		ALL			101.00		74	109		Date: 4/5/2016				
Time: 3:23:49PM																	
S Spc	T	Sample		Av		Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals			
		DBH	Trees	FF 16'	Ht Tot				Net Cu.Ft.	Net Bd.Ft.				Tons	Cunits	MBF	
DF		12	1	92	85	2.871	2.25	2.87	19.0	70.0		55	201		55	20	
DF		14	1	87	41	1.824	1.95	1.82	18.0	40.0		33	73		33	7	
DF		16	1	85	73	1.397	1.95	1.40	37.0	120.0		52	168		52	17	
DF		17	1	90	86	1.237	1.95	1.24	26.0	70.0		32	87		32	9	
DF		18	1	88	104	1.104	1.95	2.21	34.5	125.0		76	276		77	28	
DF		19	1	73	124	1.809	3.56	3.62	24.0	105.0		87	380		88	38	
DF		20	4	89	151	3.575	7.80	9.83	45.0	190.9		442	1,877		447	190	
DF		21	1	81	125	.811	1.95	2.43	27.0	103.3		66	251		66	25	
DF		22	10	89	157	7.387	19.50	23.64	48.3	208.1		1,141	4,920		1,152	497	
DF		23	1	70	130	.676	1.95	2.03	42.7	130.0		87	264		87	27	
DF		24	9	87	142	5.586	17.55	16.14	56.7	241.9		915	3,904		924	394	
DF		26	8	88	162	4.231	15.60	14.81	61.1	285.7		905	4,231		915	427	
DF		27	1	78	152	.490	1.95	1.47	65.7	260.0		97	383		98	39	
DF		28	7	88	142	3.192	13.65	9.58	74.8	344.3		716	3,297		724	333	
DF		29	4	88	147	1.701	7.80	5.53	74.4	369.2		411	2,041		415	206	
DF		30	3	87	163	1.192	5.85	4.37	81.3	385.5		355	1,684		359	170	
DF		32	5	87	148	1.746	9.75	5.59	96.9	470.0		542	2,626		547	265	
DF		34	4	88	158	1.237	7.80	4.64	98.7	465.3		458	2,159		462	218	
DF		35	1	83	185	.292	1.95	1.17	105.0	517.5		123	604		124	61	
DF		36	4	88	162	1.104	7.80	3.59	126.7	573.8		454	2,058		459	208	
DF		37	2	88	149	.522	3.90	1.57	138.7	745.0		217	1,167		219	118	
DF		38	4	88	168	.990	7.80	3.71	127.2	666.7		472	2,476		477	250	
DF		40	2	85	169	.447	3.90	1.79	133.0	702.5		238	1,256		240	127	
DF		42	1	88	179	.203	1.95	.81	157.0	785.0		127	636		129	64	
DF		46	1	88	157	.169	1.95	.51	219.7	1183.3		111	600		112	61	
DF		50	1	85	170	.143	1.95	.43	144.3	836.7		62	359		63	36	
DF		Totals	79	87	137	45.935	155.97	126.77	65.3	299.6		8,273	37,977		8,356	3,836	
RA		13	3	86	82	5.362	4.94	8.94	18.6	62.0		166	554		168	56	
RA		14	1	87	54	1.541	1.65	1.54	23.0	60.0		35	92		36	9	
RA		15	2	86	63	2.685	3.29	2.68	28.0	70.0		75	188		76	19	
RA		16	2	86	77	2.360	3.29	2.36	34.0	130.0		80	307		81	31	
RA		17	3	81	60	3.135	4.94	4.18	29.3	60.0		122	251		124	25	
RA		18	4	82	78	3.729	6.59	6.53	29.0	94.3		189	615		191	62	
RA		19	2	83	100	1.673	3.29	3.35	39.2	132.5		131	443		133	45	
RA		22	1	87	64	.624	1.65	1.25	39.0	130.0		49	162		49	16	
RA		23	2	86	57	1.142	3.29	2.28	39.0	125.0		89	285		90	29	
RA		24	1	74	68	.524	1.65	1.05	47.0	120.0		49	126		50	13	
RA		Totals	21	84	73	22.775	34.59	34.15	28.9	88.5		987	3,024		997	305	
DFL		32	1	87	167	.152	.85	.61	88.3	445.0		.00	54	271	0	54	27
DFL		42	1	87	162	.088	.85	.35	144.8	695.0		.00	51	245	0	52	25
DFL		44	1	86	167	.080	.85	.32	167.0	820.0		.00	54	264	0	54	27
DFL		60	1	86	165	.043	.85	.17	288.8	1715.0		.00	50	297	0	50	30
DFL		64	1	86	173	.038	.85	.15	356.7	1997.5		.00	54	304	0	55	31
DFL		72	2	86	174	.060	1.70	.21	505.1	2781.4		.00	106	585	0	107	59
DFL		Totals	7	87	167	.462	5.95	1.82	202.9	1080.7		0.01	369	1,965	1	373	199
BM		17	1	87	53	.343	.54	.34	35.0	70.0		12	24		12	2	
BM		Totals	1	87	53	.343	.54	.34	35.0	70.0		12	24		12	2	
SN		18	1	88	105	.918	1.62										

TC TSTNDSUM				Stand Table Summary												
Project FERN_3																
T10S R07W S27 TALL										T10S R07W S27 TALL						
Twp	Rge	Sec	Tract	Type			Acres		Plots	Sample Trees			Page:	2		
10S	07W	27	FERNHILL	ALL			101.00		74	109			Date:	4/5/2016		
													Time:	3:23:49PM		
S Spc	T	Sample		Av				Average Log		Net		Net	T o t a l s			
		DBH	Trees	FF Ht	Trees/	BA/	Logs	Net	Net	Tons/	Cu.Ft.	Bd.Ft.	Tons	Cunits	MBF	
			16' Tot	Acre	Acre	Acre	Cu.Ft.	Bd.Ft.	Acre	Acre	Acre					
SN		Totals		1	88	105	.918	1.62								
Totals		109		86	116	70.433	198.67	163.09	59.1	263.6	.01	9641	42,991	1	9,738	4,342

TC		PLOGSTVB		Log Stock Table - MBF															
T10S R07W S27 TyALL				101.00		Project:		FERN_3								Page		1	
						Acres		101.00								Date		4/5/2016	
																Time		3:39:39PM	
Spp	S T	So Gr rt de	Log Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches											
								2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-19	20-23	24-29	30-39	40+
DF		2M	26	23		23	.6									23			
DF		2M	30	16	13.5	14	.4									14			
DF		2M	32	25		25	.6					9		16					
DF		2M	34	31	6.5	29	.8										29		
DF		2M	36	29		29	.8									29			
DF		2M	38	34		34	.9						34						
DF		2M	40	2,683	2.9	2,606	67.9						201	465	904	545	395	95	
DF		3M	16	2		2	.0						2						
DF		3M	18	2		2	.1						2						
DF		3M	20	3		3	.1						3						
DF		3M	21	2		2	.1					2							
DF		3M	22	2		2	.1				2								
DF		3M	23	5		5	.1				2			3					
DF		3M	29	3		3	.1				3								
DF		3M	30	4		4	.1					4							
DF		3M	32	84		84	2.2				4	32	16	7	16	10			
DF		3M	34	5		5	.1			5									
DF		3M	36	9		9	.2			4	5								
DF		3M	38	3		3	.1			3									
DF		3M	40	592	2.6	577	15.0			88	120	133	77	43	48	41	26		
DF		4M	16	10		10	.3			1	4	4							
DF		4M	18	8		8	.2			8									
DF		4M	20	2		2	.1			2									
DF		4M	22	7		7	.2			7									
DF		4M	24	1		1	.0			1									
DF		4M	26	9		9	.2				9								
DF		4M	28	4		4	.1			4									
DF		4M	30	7		7	.2			7									
DF		4M	34	5		5	.1			5									
DF		3P	40	71	1.2	70	1.8									37	33		
DF		SM	32	92	17.6	75	2.0							27		48			
DF		SM	34	21		21	.6									21			
DF		SM	40	124		124	3.2							29	63	32			
DF		PU	12	12		12	.3									12			
DF		PU	32	21		21	.6							21					

TC		PLOGSTVB		Log Stock Table - MBF																
T10S R07W S27 TyALL101.00				Project:		FERN_3		Acres		101.00		Page		2						
												Date		4/5/2016						
												Time		3:39:39PM						
S T	So Gr rt de	Log Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches													
							2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-19	20-23	24-29	30-39	40+		
DF	Totals		3,949	2.9	3,836	88.3			134	150	176	344	518	1060	737	588	129			
DFL	2M	32	13		13	6.5											13			
DFL	2M	40	53	9.4	48	24.3							9		14	25				
DFL	3M	32	15		15	7.6											15			
DFL	3M	34	2		2	1.0							2							
DFL	3M	38	1		1	.4			0		0									
DFL	3M	40	122	2.8	118	59.5						3	3	4	29		14	65		
DFL	4M	22	0		0	.2			0											
DFL	4M	24	1		1	.3			1											
DFL	4M	28	0		0	.2			0											
DFL	Totals		207	4.1	199	4.6			1	1	0	3	3	15	14	29	54	78		
RA	CR	14	2		2	.8			2											
RA	CR	16	4	25.0	3	.9			3											
RA	CR	18	3		3	.9			3											
RA	CR	20	19		19	6.3			10			10								
RA	CR	21	2		2	.6			2											
RA	CR	23	4		4	1.4			4											
RA	CR	24	5		5	1.8			5											
RA	CR	30	56	5.0	53	17.4			7				28	18						
RA	CR	32	92	8.0	85	27.7			8		24			52						
RA	CR	36	5		5	1.7			5											
RA	CR	38	15	5.5	14	4.7			14											
RA	CR	40	111	1.2	109	35.8			8	49	36	17								
RA	Totals		319	4.2	305	7.0			61	60	69	45	70							
BM	CR	40	2		2	100.0			2											
BM	Totals		2		2	.1			2											
Total	All Species		4,477	3.0	4,342	100.0			198	211	245	392	591	1075	752	617	183	78		



Legend

Boundaries

- Timber Sale Boundary
- - - State Forest Property Boundary
- == Right of Way (Posted)

Roads

- ==== Surfaced Road
- == Unsurfaced Road
- New Construction

Streams

- — · Type F Stream
- — ··· Type N Stream
- Posted Stream Buffer

- ▨ Reforestation Area

- Cable Corridors

- ◆ Land Survey Monument

- © Cultural Resource Site

- ▨ Green Tree Retention Area

LOGGING PLAN

OF TIMBER SALE CONTRACT NO. 341-17-47
FERN HILL
PORTIONS OF SECTIONS 22, 27 & 28, T10S, R7W, W.M.,
BENTON COUNTY, OREGON

This product is for informational use and may not have been prepared for or be suitable for legal, engineering or survey purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of this information.

Scale

1:12,000



	NET ACRES	NET ACRES
AREA	TRACTOR	CABLE
1 (MC)	30	3
2 (MC)	26	42
TOTAL	56	45



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